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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,301	04/27/2004	Daniel J. Farrar	SYB/0099.01	3300
31779	7590	07/26/2006	EXAMINER	
JOHN A. SMART 708 BLOSSOM HILL RD., #201 LOS GATOS, CA 95032-3503			GORTAYO, DANGELINO N	
			ART UNIT	PAPER NUMBER
			2168	

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/709,301	<b>Applicant(s)</b> FARRAR ET AL.	
	<b>Examiner</b> Dangelino N. Gortayo	<b>Art Unit</b> 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/06/04 3/17/05</u> | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-43 are pending.

#### *Information Disclosure Statement*

2. An initialed and dated copy of Applicant's IDS form 1449, filed 3/17/2005, is attached to the instant Office action.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-43 are rejected under 35 U.S.C. 102(e) as being anticipated by Lenzie ("Lenzie" US Patent 6,728,720 B1)

As per claim 1, Lenzie teaches "a method for recommending database indexes to be created for optimizing system performance, the method comprising:" (see Abstract)

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"capturing a workload representative of database queries employed during system use;" (column 5 lines 17-22, wherein a copy is made of all the SQL queries supplied to the engine over a selected period of time)

"creating virtual indexes for optimizing system performance during execution of the database queries captured in the workload;" (column 5 lines 22-28 and column 8 lines 8-13, wherein an index optimizer creates a set of preferred indexes for a database)

"computing cost benefits for different combinations of the virtual indexes;" (column 9 lines 24-40, wherein the cost of indexes are calculated)

"and recommending physical indexes to be created based on virtual indexes that have favorable cost benefits for the captured workload." (column 12 lines 53-59, wherein an index with the highest cost saving is selected)

As per claim 2, Lenzie teaches "said virtual indexes comprise in-memory data structures corresponding to sets of potential physical indexes." (column 10 line 66 – column 11 line 9)

As per claim 3, Lenzie teaches "the capturing step includes: displaying a screen input button that a user may invoke to record a usage session as a workload." (column 9 lines 7-16, wherein a user invokes the testing using representative data)

As per claim 4, Lenzie teaches "the workload represents user execution of a database application with a typical workload that is contemplated for the application." (column 8 line 63 – column 9 line 6, wherein up-to-date statistics are kept for the database queries)

As per claim 5, Lenzie teaches "the workload includes information recording text of all the queries operating during the capture of the workload." (column 9 lines 24-30)

As per claim 6, Lenzie teaches "the workload includes information recording settings for certain options that affect how queries are optimized." (column 8 lines 8-16)

As per claim 7, Lenzie teaches "the capturing step includes: capturing information about a set of workloads to define a problem instance." (column 9 lines 41-54)

As per claim 8, Lenzie teaches " setting a limit on how much disk space is available for physical indexes." (column 9 lines 55-61, wherein the size of the tables is limited)

As per claim 9, Lenzie teaches "the recommending step takes into account the limit on disk space available for physical indexes." (column 5 lines 10-16)

As per claim 10, Lenzie teaches "the recommending step includes: if the physical indexes to be recommended for creation exceed the limit on disk space available for physical indexes, removing some of the physical indexes from consideration." (column 12 lines 33-52, wherein index maintenance is done)

As per claim 11, Lenzie teaches "the physical indexes removed from consideration are ones having less favorable cost benefits for the captured workload." (column 13 lines 57-67)

As per claim 12, Lenzie teaches "the physical indexes removed from consideration comprise at least 20 percent of bottom performing indexes considered for recommendation." (column 13 lines 31-47)

As per claim 13, Lenzie teaches “specifying whether certain types of indexes should be considered at all.” (column 14 lines 1-9)

As per claim 14, Lenzie teaches “the creating virtual indexes step includes: searching for relevant indexes that will help the system's optimizer use sargable predicates for partial index scans.” (column 14 lines 1-6, wherein a preferred index set based on recorded patterns of user queries is index searchable)

As per claim 15, Lenzie teaches “the optimizer creates virtual indexes without specifying ordering of columns used in sargable equality predicates.” (column 11 lines 53-65)

As per claim 16, Lenzie teaches “the creating virtual indexes step includes: searching for relevant indexes that will help provide useful orderings.” (column 12 line 60 – column 13 line 4, wherein preferred indexes are searched for ordering)

As per claim 17, Lenzie teaches “columns of virtual indexes may be order-independent “don't care” columns that satisfy some interesting ordering wish list of the system's optimizer.” (column 13 line 5-18)

As per claim 18, Lenzie teaches “columns of virtual indexes may have an unspecified sortedness.” (column 13 line 19-22)

As per claim 19, Lenzie teaches “collapsing some of the virtual indexes together, if feasible for the workload.” (column 13 lines 48-56)

As per claim 20, Lenzie teaches “the collapsing step includes: identifying that columns of one virtual index are a superset of another the columns of another virtual

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index, and that both indexes may be combined into a single virtual index that is feasible for the workload;" (column 13 lines 38-43)

"and identifying that sortedness of a column of a virtual index, if unspecified, may be specified to allow it to be combined with an index with identical columns but specified sortedness;" (column 13 lines 42-47)

"and identifying that a virtual index that has columns of opposite sortedness of a second virtual index, and that both indexes may be combined into a single virtual index." (column 13 lines 48-56)

As per claim 21, Lenzie teaches "polling periodically in the method to ensure that the system is working with accurate cost information." (column 5 lines 29-33, wherein a user is polled about system performance)

As per claim 22, Lenzie is disclosed as per claim 1 above. Additionally, Lenzie teaches "A computer-readable medium having processor-executable instructions" (column 4 lines 15-23)

As per claim 23, Lenzie is disclosed as per claim 1 above. Additionally, Lenzie teaches "A downloadable set of processor-executable instructions" (column 4 lines 15-23)

As per claim 24, Lenzie teaches "A system that recommends database indexes to be created for optimizing system performance, the system comprising:" (see Abstract)

"a database system that executes database queries;" (column 4 lines 43-50)

“and an index consultant for capturing a workload representative of database queries executed during typical system use;” (column 5 lines 17-22, wherein a copy is made of all the SQL queries supplied to the engine over a selected period of time) “creating virtual indexes for optimizing system performance during execution of the database queries captured in the workload;” (column 5 lines 22-28 and column 8 lines 8-13, wherein an index optimizer creates a set of preferred indexes for a database) “computing cost benefits for different combinations of the virtual indexes;” (column 9 lines 24-40, wherein the cost of indexes are calculated) “and recommending physical indexes to be created based on virtual indexes that have favorable cost benefits for the captured workload.” (column 12 lines 53-59, wherein an index with the highest cost saving is selected)

As per claim 25, Lenzie teaches “said virtual indexes comprise in-memory data structures corresponding to sets of potential physical indexes.” (column 10 line 66 – column 11 line 9)

As per claim 26, Lenzie teaches “the index consultant displays a screen input button that a user may invoke to record a usage session as a workload.” (column 9 lines 7-16, wherein a user invokes the testing using representative data)

As per claim 27, Lenzie teaches “the workload represents user execution of a database application with a typical workload that is contemplated for the application.” (column 8 line 63 – column 9 line 6, wherein up-to-date statistics are kept for the database queries)



As per claim 28, Lenzie teaches “the workload includes information recording text of all the queries operating during the capture of the workload.” (column 9 lines 24-30)

As per claim 29, Lenzie teaches “the workload includes information recording settings for certain options that affect how queries are optimized.” (column 8 lines 8-16)

As per claim 30, Lenzie teaches “the index consultant captures information about a set of workloads to define a problem instance.” (column 9 lines 41-54)

As per claim 31, Lenzie teaches “ the index consultant may receive information specifying a limit on how much disk space is available for physical indexes.” (column 9 lines 55-61, wherein the size of the tables is limited)

As per claim 32, Lenzie teaches “the index consultant takes into account the limit on disk space available for physical indexes.” (column 5 lines 10-16)

As per claim 33, Lenzie teaches “the index consultant removes some of the physical indexes from consideration, when sufficient disk space is unavailable.” (column 12 lines 33-52, wherein index maintenance is done)

As per claim 34, Lenzie teaches “the physical indexes removed from consideration are ones having less favorable cost benefits for the captured workload.” (column 13 lines 57-67)

As per claim 35, Lenzie teaches “the physical indexes removed from consideration comprise at least 20 percent of bottom performing indexes considered for recommendation.” (column 13 lines 31-47)

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As per claim 36, Lenzie teaches “the index consultant allows user input specifying whether certain types of indexes should be considered at all.” (column 14 lines 1-9)

As per claim 37, Lenzie teaches “the index consultant searches for relevant indexes that will help the system's optimizer use sargable predicates for partial index scans.” (column 14 lines 1-6, wherein a preferred index set based on recorded patterns of user queries is index searchable)

As per claim 38, Lenzie teaches “the optimizer creates virtual indexes without specifying ordering of columns used in sargable equality predicates.” (column 11 lines 53-65)

As per claim 39, Lenzie teaches “the index consultant searches for relevant indexes that will help provide useful interesting (order or grouping) properties.” (column 12 line 60 – column 13 line 4, wherein preferred indexes are searched for ordering)

As per claim 40, Lenzie teaches “columns of indexes created may reflect order-independent “don't care” columns that satisfy some interesting ordering wish lists of the system's optimizer.” (column 13 line 5-18)

As per claim 41, Lenzie teaches “the index consultant attempts to collapse some of the virtual indexes together, if feasible for the workload.” (column 13 lines 48-56)

As per claim 42, Lenzie teaches “the index consultant attempts to identify that columns of one index are a superset of the columns of another index, and that both indexes may be combined into a single index that is feasible for the workload.” (column 13 lines 38-56)

As per claim 43, Lenzie teaches "operation of the index consultant may be polled during operation to ensure that the system is working with accurate cost information."  
(column 5 lines 29-33, wherein a user is polled about system performance)

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Adya et al. (US Patent 6,266,658 B1)

Hall (US Patent 6,934,701 B1)

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dangelino N. Gortayo whose telephone number is (571)272-7204. The examiner can normally be reached on M-F 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim T. Vo can be reached on (571)272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dangelino N. Gortayo  
Examiner

Tim T. Vo  
SPE

DZ

A handwritten signature in black ink, appearing to read 'Tim Vo', with a long, sweeping horizontal stroke extending to the left.

**TIM VO**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**